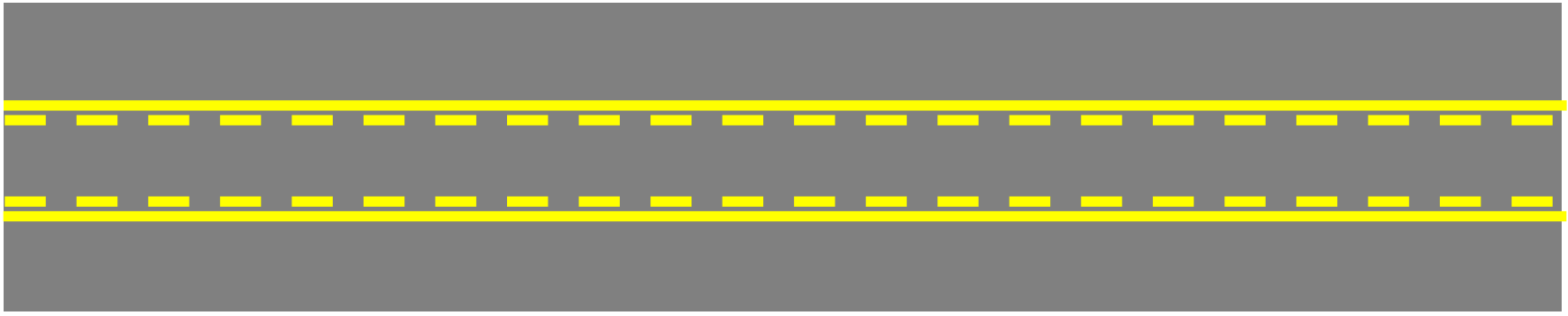
Chapter 12

Strip Studies



Strip Study

- Identification of crashes along a strip of roadway based on the specified county, dates, and Y-line, coinciding routes, and milepost range

- Beginning and ending mileposts must be specified

- All coinciding routes (high order and low order) must be entered

- All strip studies are milepost dependant

- Also called “segment” or “section” studies

Standard Parameters

General Strip Studies:

Date range = 3 years

Y-line = 0 feet

(allows for a comparison with crash rates)

Fatal Strip Studies:

Date range = 5 years

Y-line = 0 feet

(allows for broader information - especially on rural roads)

Pedestrian and/or Bicycle Strip Studies:

Date range = 10 years

Y-line = 50 feet

(smaller subset of data; captures parallel crosswalk areas)

Standard Parameters (Cont.)

Highway Safety Improvement Program (HSIP) Strip Studies:

Date range = 5 or 10 years (depending on the warrant)

Y-line = 0 feet

(allows for a comparison with safety warrants)

Bridge Strip Studies:

Date range = 5 years

Y-line = 0 feet

Milepost range = length of bridge + 500 feet on either end

(milepost range can be expanded depending on site issues)

Interchange Studies:

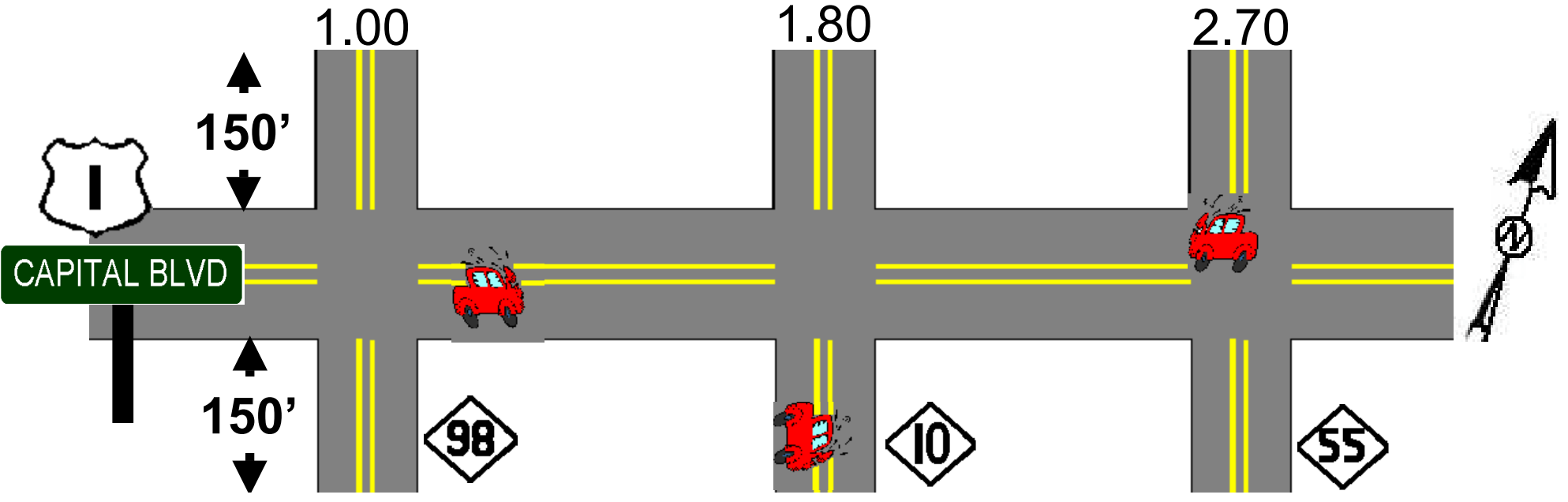
Date range = 3 years

Y-line = 0 feet (performed as two strip studies)

Strips - Milepost Dependant

Study Milepost Definition

US 1, MP 1.00 to MP 2.70



The following reported crashes would be included in a study of US 1/Capital Blvd from MP 1.00 to MP 2.70 (150’ Y-Line):

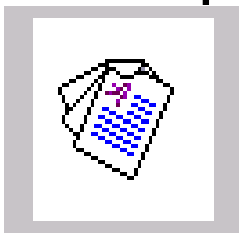
ON RD	FROM RD	FROM DIST	FROM DIR	MP
Capital Blvd	NC 98	250 ft	E	1.05
NC 10	US 1	100 ft	S	1.80
US 1	NC 55	0 ft		2.70

Strip Identification

- Strip locations are identified by **MILEPOST** ranges (not route combinations)!
- When performing a strip study, it is necessary to determine all possible coinciding routes.
- Get the features reports for all coinciding strip routes.
- If your strip routes are not mileposted then they will need to be mileposted prior to performing the study.
- Crashes are identified by the study parameters and located on the strip by their milepost!

Strip Study Screen

- Access the Strip Study screen by selecting the following:

 ⇒ Strip Study Report

- 4 Tabs within the Strip Study screen:

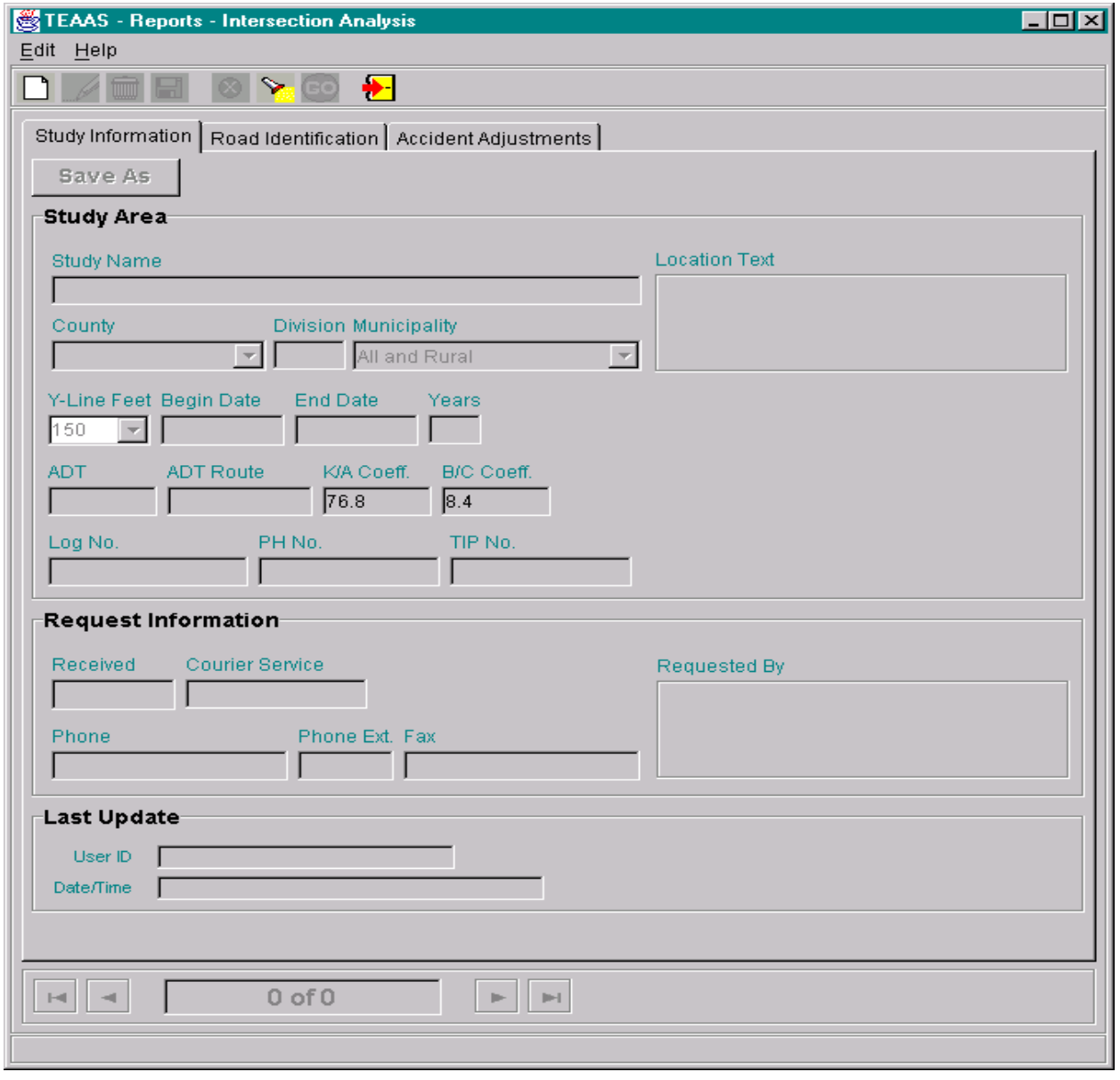
– **Study Information** - allows for entry of general study information

– **Road Identification** - allows users to generate a Fiche Report, and to specify the coinciding routes

– **Accident Adjustments** - allows users to include or exclude accidents

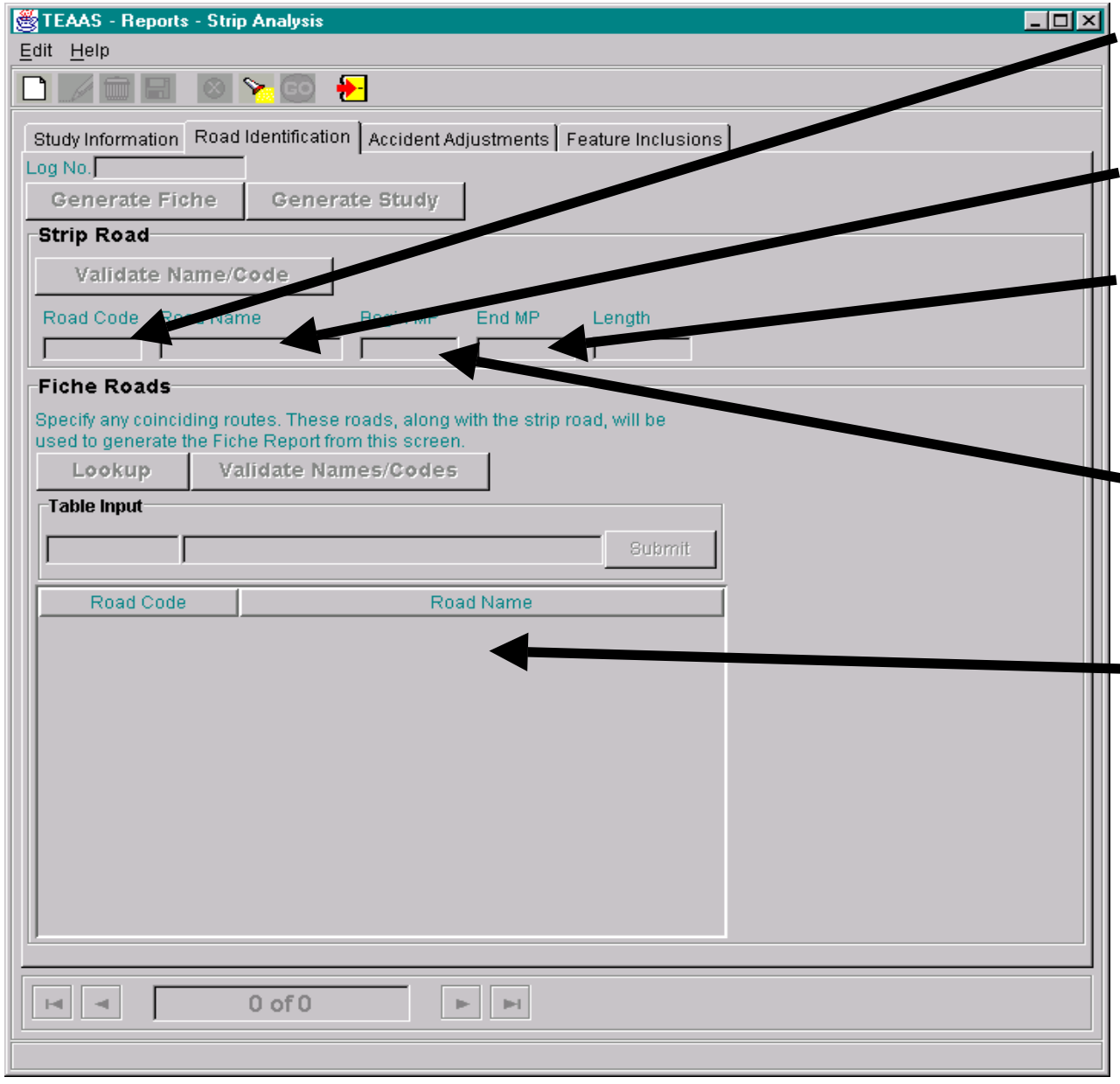
– **Feature Inclusion** - allows users to include Features not currently inventoried

Study Information Tab



See Chapter 10 for information on this screen.

Road Identification Tab



Strip road 8-digit code

Strip road name

Strip road ending milepost

Strip road beginning milepost

Coinciding route names and 8-digit codes

Remember - use caution when using the "Lookup" button!

Road Identification Tab (Cont.)

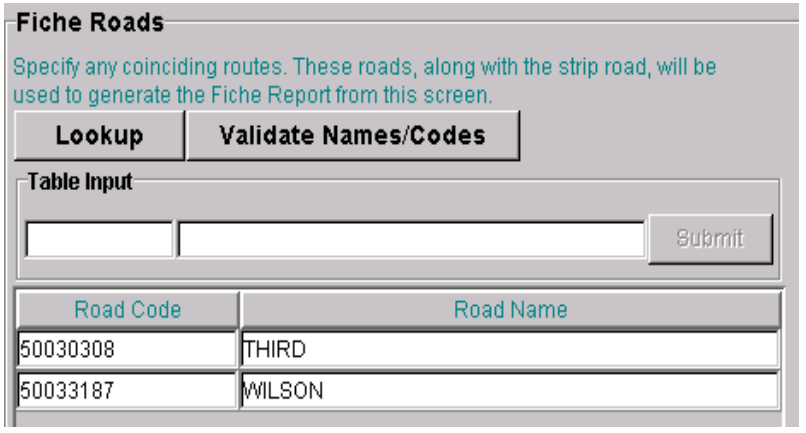
- In the “Strip Road” section, enter a road that represents the most continuous segment for the location under study. A road name of up to 25 alphanumeric characters **OR** a valid 8-digit code may be entered.

- Enter the beginning and ending mileposts for the strip road.

- Click the **“Validate Name/Code”** button.

- Enter names or 8-digit codes for coinciding routes in the “Fiche Roads” section

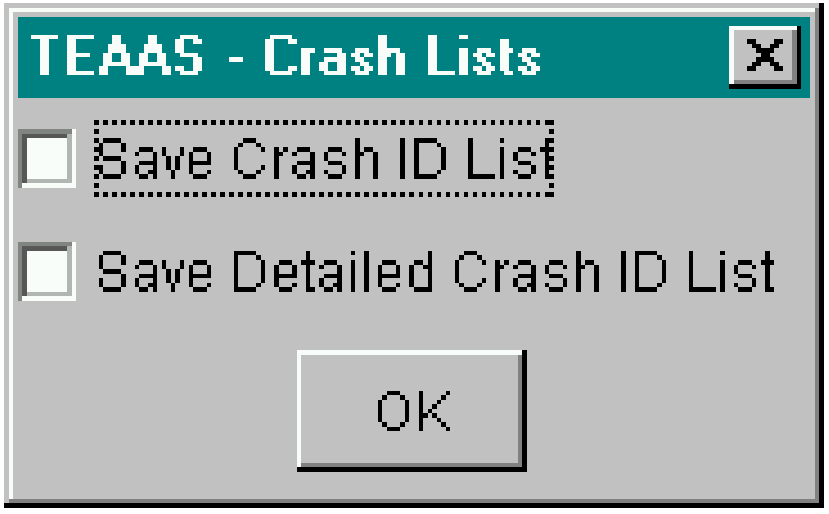
- Click the **“Validate Names/Codes”** button.



Road Identification Tab (Cont.)

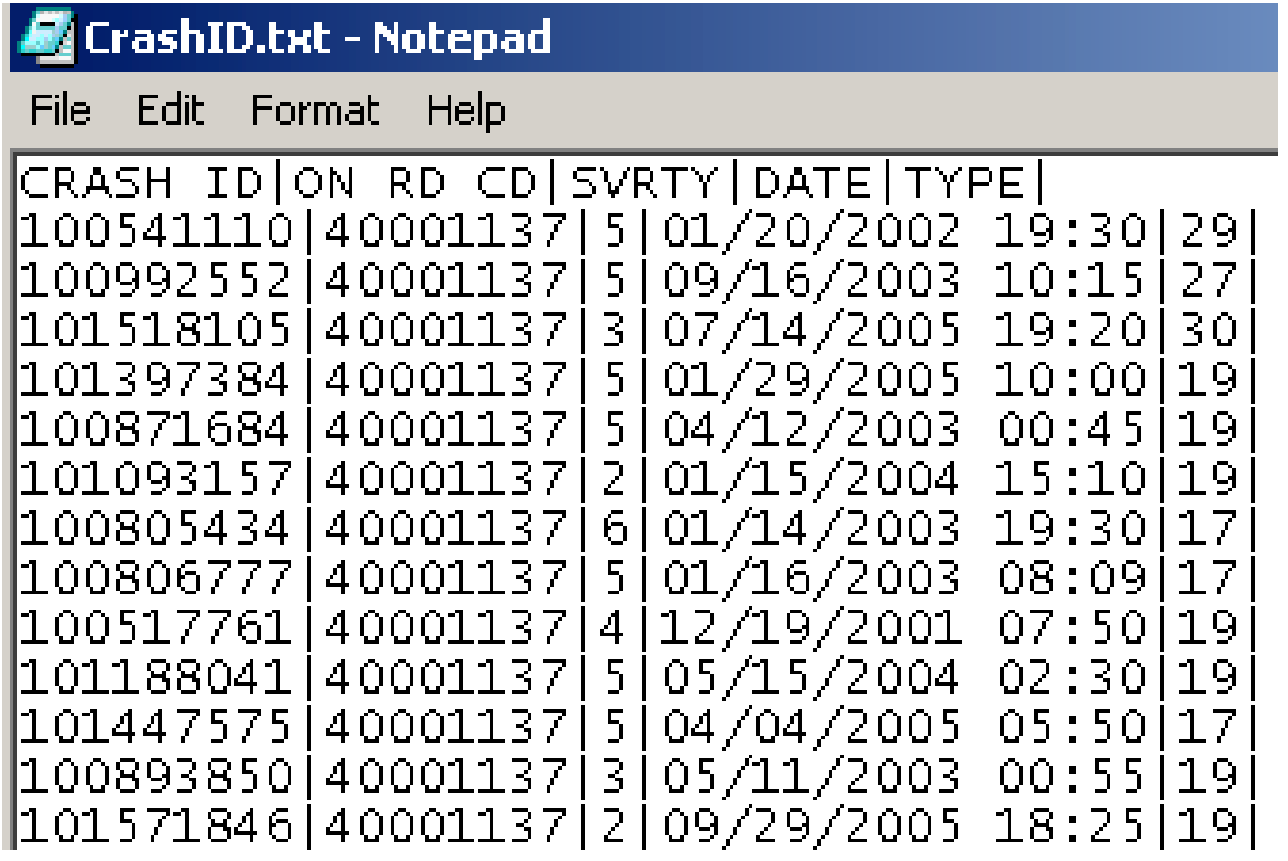
- Click on the **"Generate Study"** button to run a strip study based on the study criteria.

- A dialog box will prompt users to save a "Crash ID List" (crash level information) or a "Detailed Crash ID List" (person level information). Select the output option (if desired) and click the **"OK"** button. If selected, this information will be saved as a text file.



Crash ID List

- This text file contains 5 columns of crash-level crash data.
- It may be imported into Excel or Access for further review.



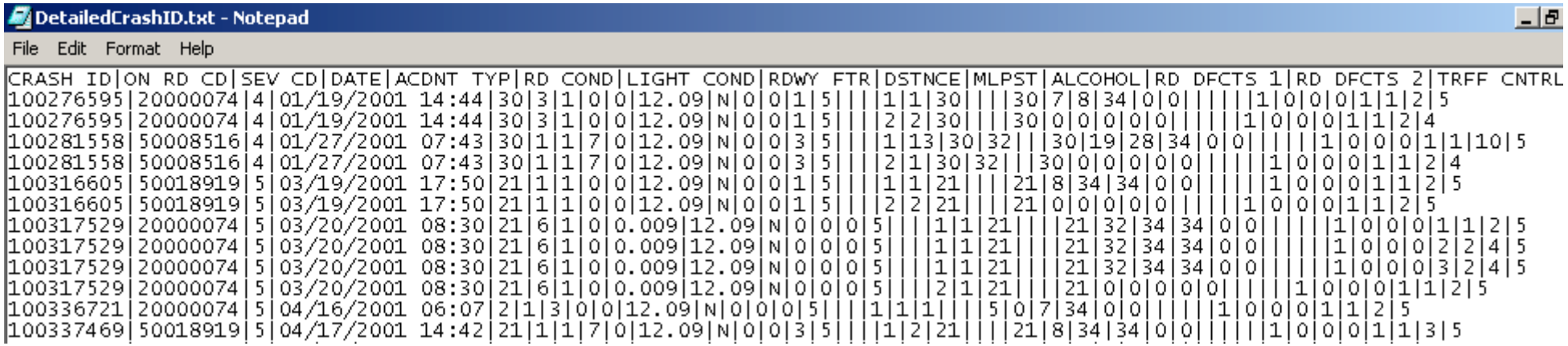
CrashID.txt - Notepad

File Edit Format Help

```
CRASH ID|ON RD CD|SVRTY|DATE|TYPE|
100541110|40001137|5|01/20/2002 19:30|29|
100992552|40001137|5|09/16/2003 10:15|27|
101518105|40001137|3|07/14/2005 19:20|30|
101397384|40001137|5|01/29/2005 10:00|19|
100871684|40001137|5|04/12/2003 00:45|19|
101093157|40001137|2|01/15/2004 15:10|19|
100805434|40001137|6|01/14/2003 19:30|17|
100806777|40001137|5|01/16/2003 08:09|17|
100517761|40001137|4|12/19/2001 07:50|19|
101188041|40001137|5|05/15/2004 02:30|19|
101447575|40001137|5|04/04/2005 05:50|17|
100893850|40001137|3|05/11/2003 00:55|19|
101571846|40001137|2|09/29/2005 18:25|19|
```

Detailed Crash ID List

- This text file contains 43 columns of person-level crash data.
- It may be imported into Excel or Access for further review.



DetailedCrashID.txt - Notepad

File Edit Format Help

```
CRASH ID|ON RD CD|SEV CD|DATE|ACDNT TYP|RD COND|LIGHT COND|RDWY FTR|DSTNCE|MLPST|ALCOHOL|RD DFCTS 1|RD DFCTS 2|TRFF CNTRL
100276595|20000074|4|01/19/2001 14:44|30|3|1|0|0|12.09|N|0|0|1|5||||1|1|30||||30|7|8|34|0|0||||||1|0|0|0|1|1|2|5
100276595|20000074|4|01/19/2001 14:44|30|3|1|0|0|12.09|N|0|0|1|5||||2|2|30||||30|0|0|0|0|0||||||1|0|0|0|1|1|2|4
100281558|50008516|4|01/27/2001 07:43|30|1|1|7|0|12.09|N|0|0|3|5||||1|13|30|32|||30|19|28|34|0|0|||||1|0|0|0|1|1|10|5
100281558|50008516|4|01/27/2001 07:43|30|1|1|7|0|12.09|N|0|0|3|5||||2|1|30|32|||30|0|0|0|0|0|||||1|0|0|0|1|1|2|4
100316605|50018919|5|03/19/2001 17:50|21|1|1|0|0|12.09|N|0|0|1|5||||1|1|21||||21|8|34|34|0|0|||||1|0|0|0|1|1|2|5
100316605|50018919|5|03/19/2001 17:50|21|1|1|0|0|12.09|N|0|0|1|5||||2|2|21||||21|0|0|0|0|0|||||1|0|0|0|1|1|2|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||1|1|21||||21|32|34|34|0|0|||||1|0|0|0|1|1|2|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||1|1|21||||21|32|34|34|0|0|||||1|0|0|0|2|2|4|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||1|1|21||||21|32|34|34|0|0|||||1|0|0|0|3|2|4|5
100317529|20000074|5|03/20/2001 08:30|21|6|1|0|0.009|12.09|N|0|0|0|5||||2|1|21||||21|0|0|0|0|0|||||1|0|0|0|1|1|2|5
100336721|20000074|5|04/16/2001 06:07|2|1|3|0|0|12.09|N|0|0|0|5||||1|1|1||||5|0|7|34|0|0|||||1|0|0|0|1|1|2|5
100337469|50018919|5|04/17/2001 14:42|21|1|1|7|0|12.09|N|0|0|3|5||||1|2|21||||21|8|34|34|0|0|||||1|0|0|0|1|1|3|5
```

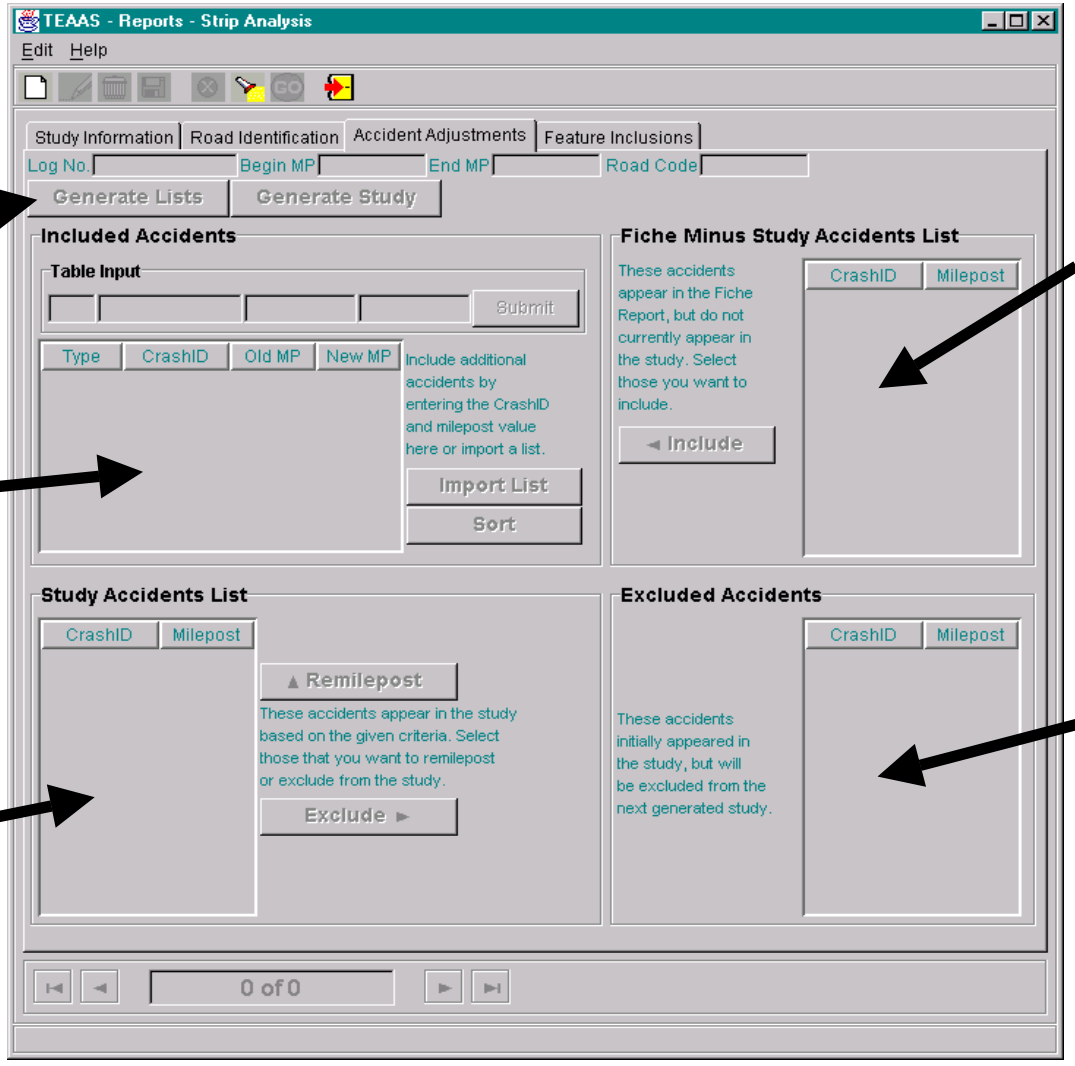
Accident Adjustments Tab

- Allows users to edit (add, delete, re-milepost) crashes.
- Click the **"Generate Lists"** button to populate the data.

"Generate Lists" Button

"Included Accidents" table

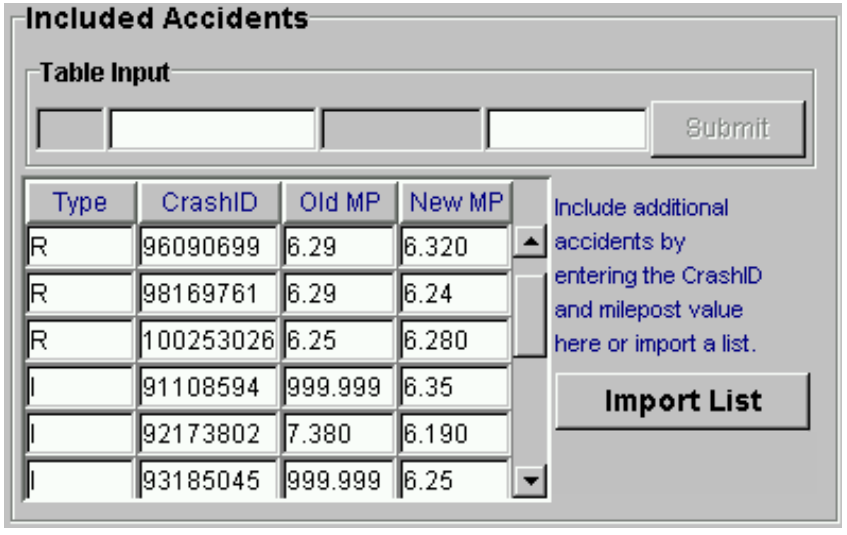
"Study Accidents List" table



"Fiche Minus Study Accidents List" table

"Excluded Accidents" table

Included Accidents



Crashes added to the study by:

1) Including crashes from the "Fiche Minus Study Accidents" table

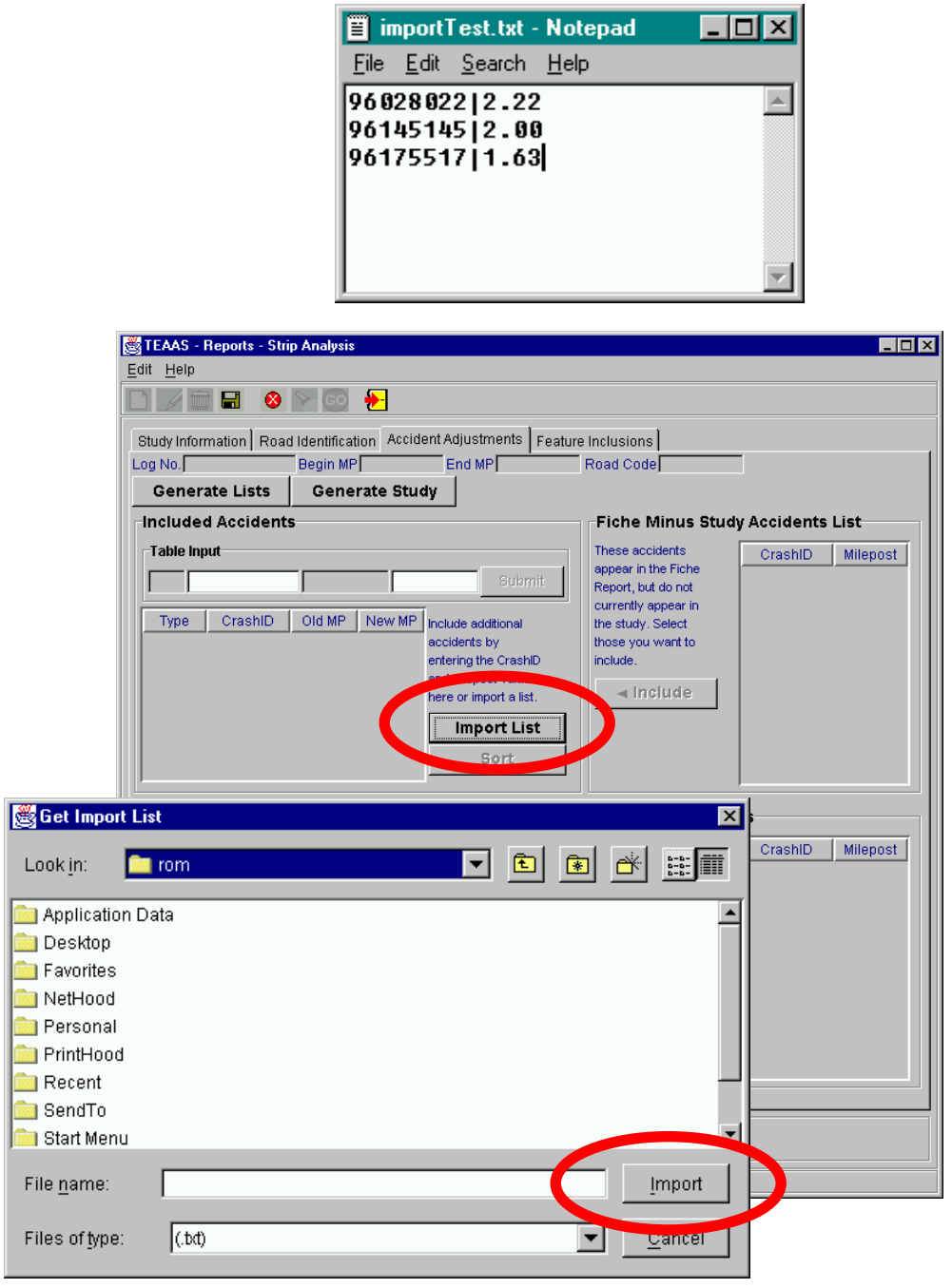
2) Entering a Crash ID and new milepost into the "Table Input" section and clicking the **"Submit"** button

3) Clicking the **"Import List"** button to import a text file containing Crash IDs and milepost values

4) All added crashes must be given a new milepost that falls within the range specified for the strip road in the "Road Identification" tab.

Included Accidents - Importing a List

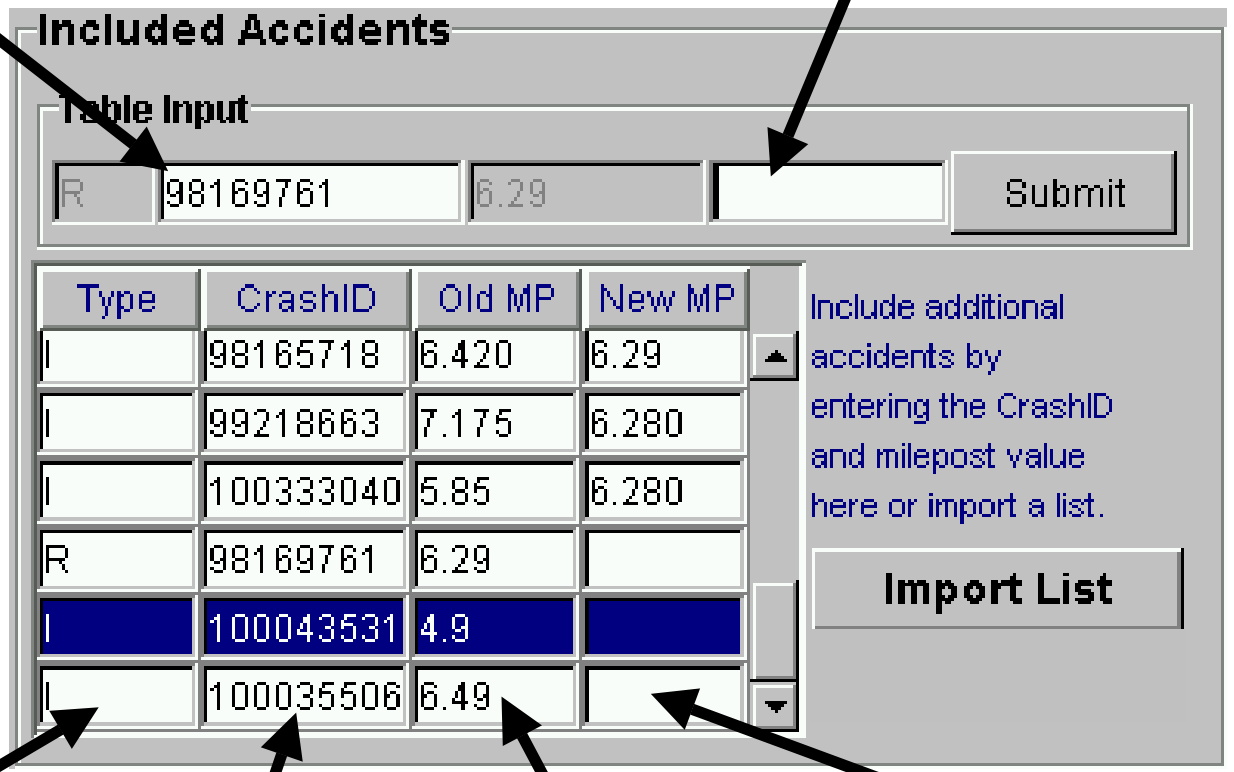
To import a list of crashes, they must first be saved into a text file with the Crash ID and milepost values separated by the “pipe” symbol (|). The text file should have no headers, and each row should have no more than one crash and milepost value. To import the crashes, the system will prompt users to locate the text file. Once located, click the “Import” button to import the list.



Included Accidents (Cont.)

Crash ID currently being edited

Field to enter new milepost value



Shows all crashes that were either included or remileposted

Type of edit
I = Included
R = Remileposted

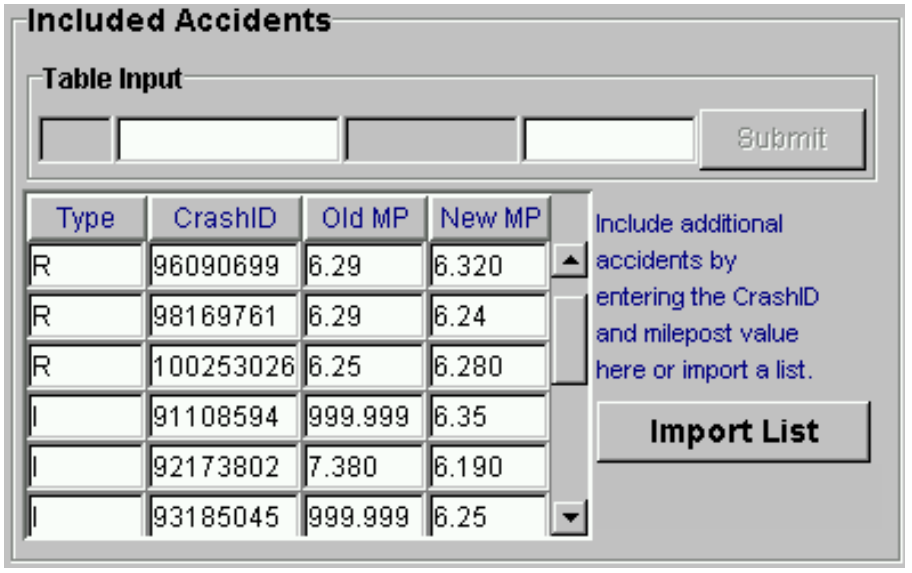
Crash IDs

Old milepost value

New milepost value
(blank until edited)

Included Accidents (Cont.)

- To delete crashes:
  - Highlight the Crash ID
  - Click the **“Delete”** key
  - Highlight multiple records with the **“Ctrl”** or **“Shift”** keys

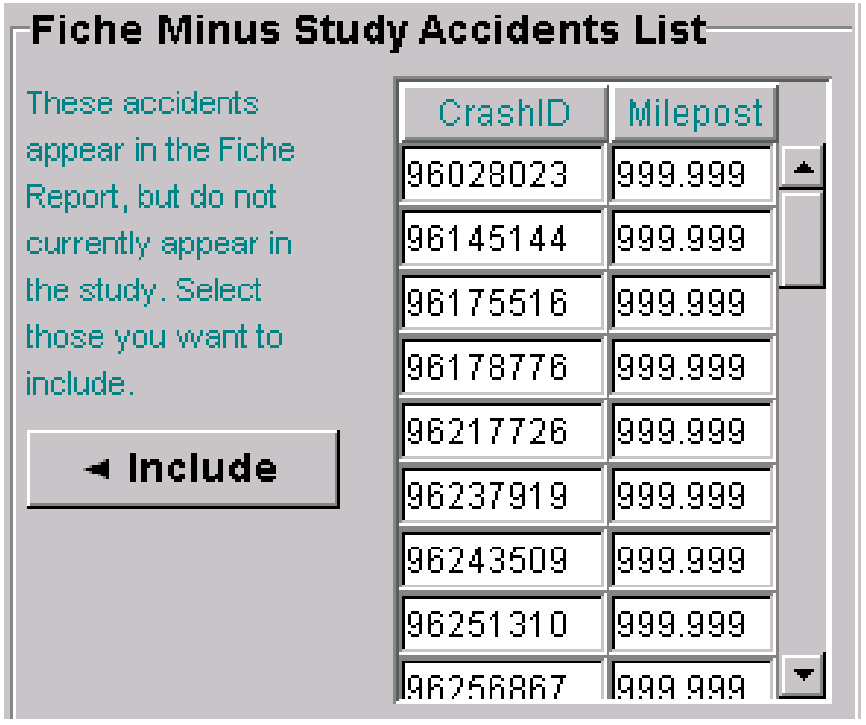


- To edit mileposts:
  - Highlight the Crash ID
  - Click the **“Enter”** key
  - Edit the milepost value
  - Click the **“Submit”** button

(Note - editing the milepost value of a crash only affects the current study and does not change the crash’s milepost in the system.)

Fiche Minus Study Accidents List

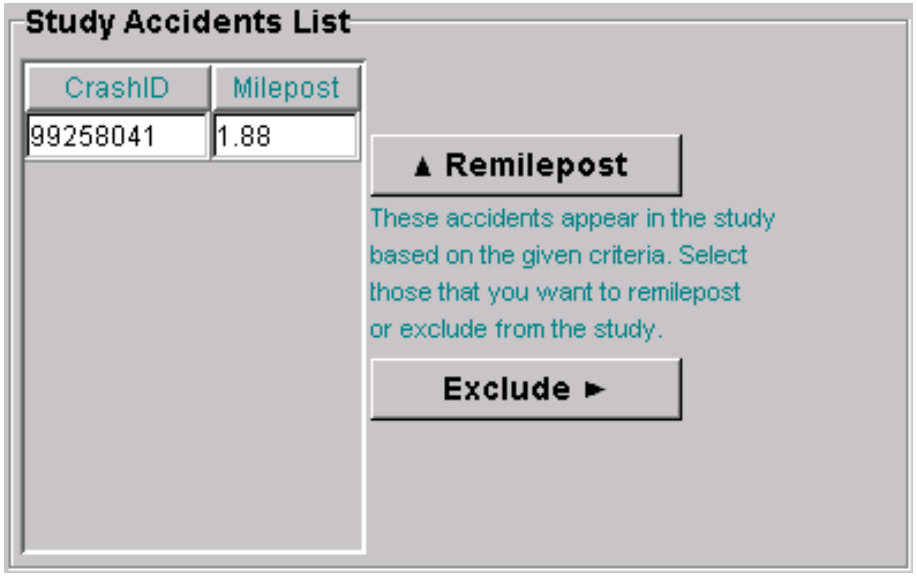
- Crashes appearing in this table are contained within the fiche report but have not been included in the study.



- To include crashes from this table into the study:
  - Highlight the Crash ID
  - Click the **"Include"** button
  - Highlight multiple records with the **"Ctrl"** or **"Shift"** keys

Study Accidents List

- Crashes appearing in this table are in the study but may or may not be on the fiche report.



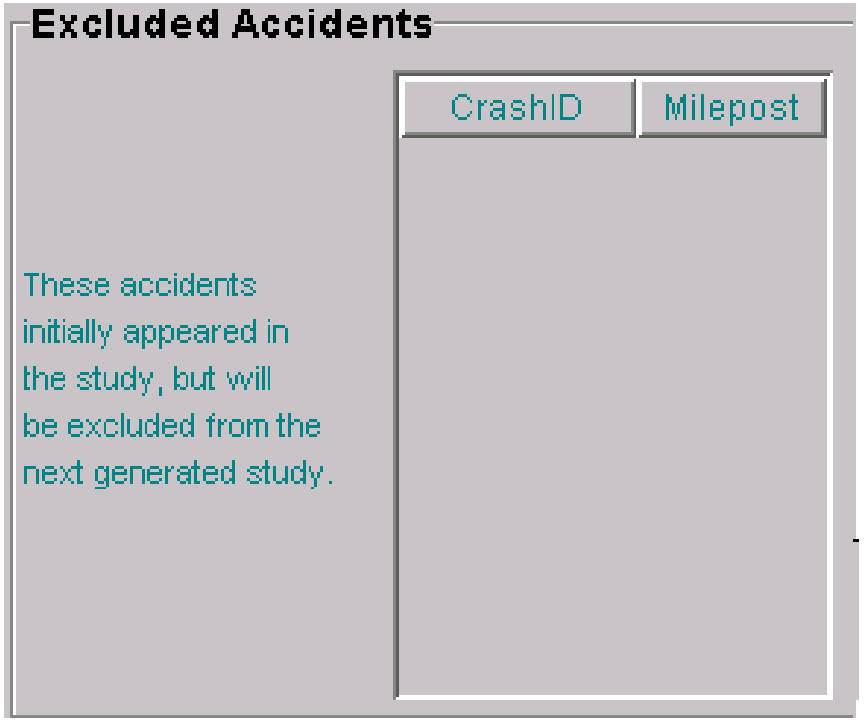
- To remilepost crashes, highlight the Crash ID(s) and click the “Remilepost” button. These crashes will be moved to the “Included Accidents” table where their mileposts can then be edited.

- To exclude crashes from the study:
  - Highlight the Crash ID and click the **“Exclude”** button
  - Highlight multiple records with the **“Ctrl”** or **“Shift”** keys

(Excluded crashes are moved to the “Excluded Accidents” table.)

Excluded Accidents

- Can only be populated by excluding crashes from the “Study Accidents List” table



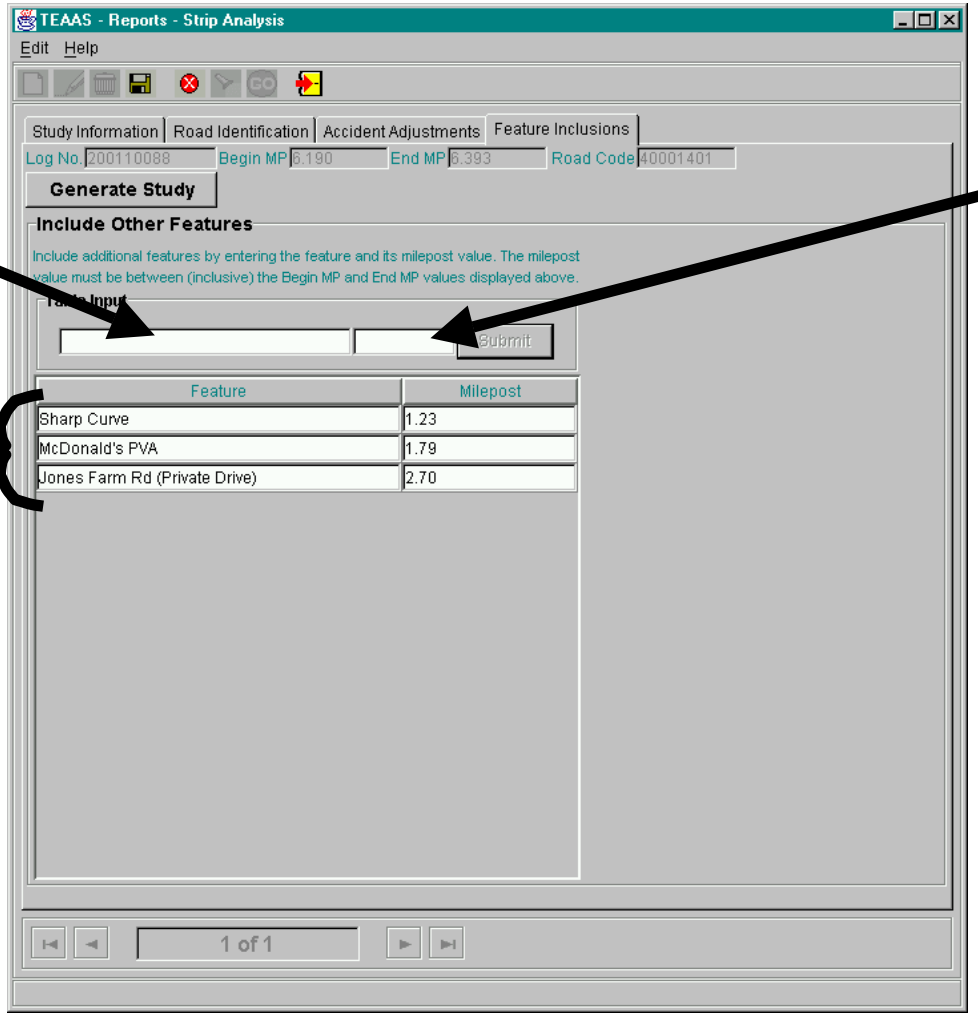
- To delete crashes from this panel
  - Highlight the Crash ID
  - Click the **“Delete”** key
  - Highlight multiple records using the **“Ctrl”** or **“Shift”** keys

Feature Inclusions Tab

The “Feature Inclusions” tab allows users to include features and their location (milepost) that have not been inventoried on the strip road.

Field to enter the text of the new feature

Shows all features that have already been added



Field to enter the milepost of the new feature

Features Inclusions Tab (Cont.)

To add a feature:

- Enter the feature text in the first field of the “Table Input” section
- Enter the feature’s milepost in the second field of the “Table Input” section (must be in the range specified for the strip road)
- Click the **“Submit”** button
- Repeat the process until all additional features have been added

(Note - adding features to a study does not add them to any feature report nor does it include them in the system.)

Features Inclusions Tab (Cont.)

To modify a feature:

- Highlight the row of the feature to be modified
- Click the **"Enter"** key
- Modify the the record in the "Table Input" section
- Click the **"Submit"** button

To delete a feature:

- Highlight the row of the feature to be deleted
- Click the **"Delete"** key
- Highlight multiple records using the **"Ctrl"** or **"Shift"** keys

Steps in Completing Strip Studies

1) Determine the location and reason for the study
   - Review maps
   - Run feature report(s)
   - Determine or calculate traffic volumes (AADTs)
   - Milepost strip road (if road is not already mileposted)
2) Enter study criteria
3) Generate a fiche report
4) Generate the initial study
5) Evaluate the fiche report and compare it with the initial study to determine if any crashes need to be added, deleted or remileposted
6) Add, delete, and/or remilepost crashes on the study in the "Accident Adjustments" tab
7) Add features on the "Features Inclusion" tab (if necessary)
8) Generate the final study

Strip Study Example

Suppose you perform an Strip Study on SR 1335 in Washington County (MP 0.00-2.22), from 1/1/1996 through 12/31/1999, with a Y-Line of 50 feet.

Step A - Gather all maps (county, city, traffic count, etc.)

Step B - Run features reports

After reviewing the maps and studying other materials it was determined that the coinciding routes of SR 1335 are Third and Wilson. These two additional roads must be included as coinciding routes.

Step C - Calculate the weighted AADT (1,700 VPD)

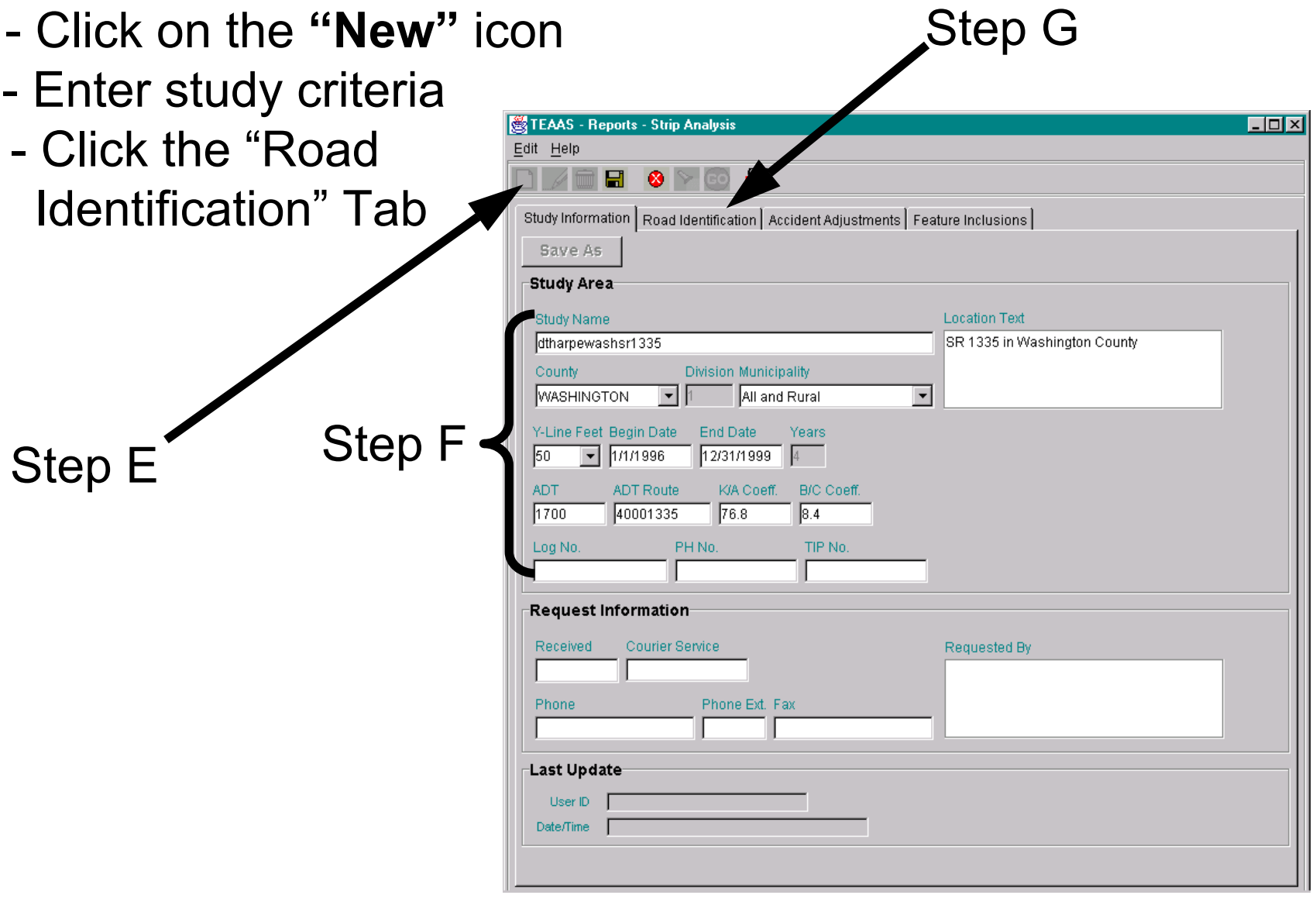
Strip Study Example (Cont.)

Step D - SR 1335 is not mileposted and must be manually mileposted. By using maps and other available information it has been determined that the following features need to be mileposted on SR 1335:

FEATURE	MP
PLYMOUTH CITY LIMITS	0.70
SR 1336/BATEMAN ST	1.08
START OF THIRD ST	1.96
HYMAN LANE	1.01
CAMPBELL ST	0.88
PINE ST	0.80
GOLF ST	1.36
WASHINGTON ST	2.20
JEFFERSON ST	2.11
MONROE ST	2.04
FOURTH ST	1.88
RR TRACKS	1.81
CHESTNUT ST (NORTHERN END)	1.79
CHESTNUT ST (SOUTHERN END)	1.60
US 64	0.00
POST OFFICE	2.13
WALMART PVA	1.85

Strip Study Example (Cont.)

Step E - Click on the **"New"** icon
Step F - Enter study criteria
Step G - Click the "Road Identification" Tab



Strip Study Example (Cont.)

Step H - Enter the study route (SR 1335) in the “Strip Road” section

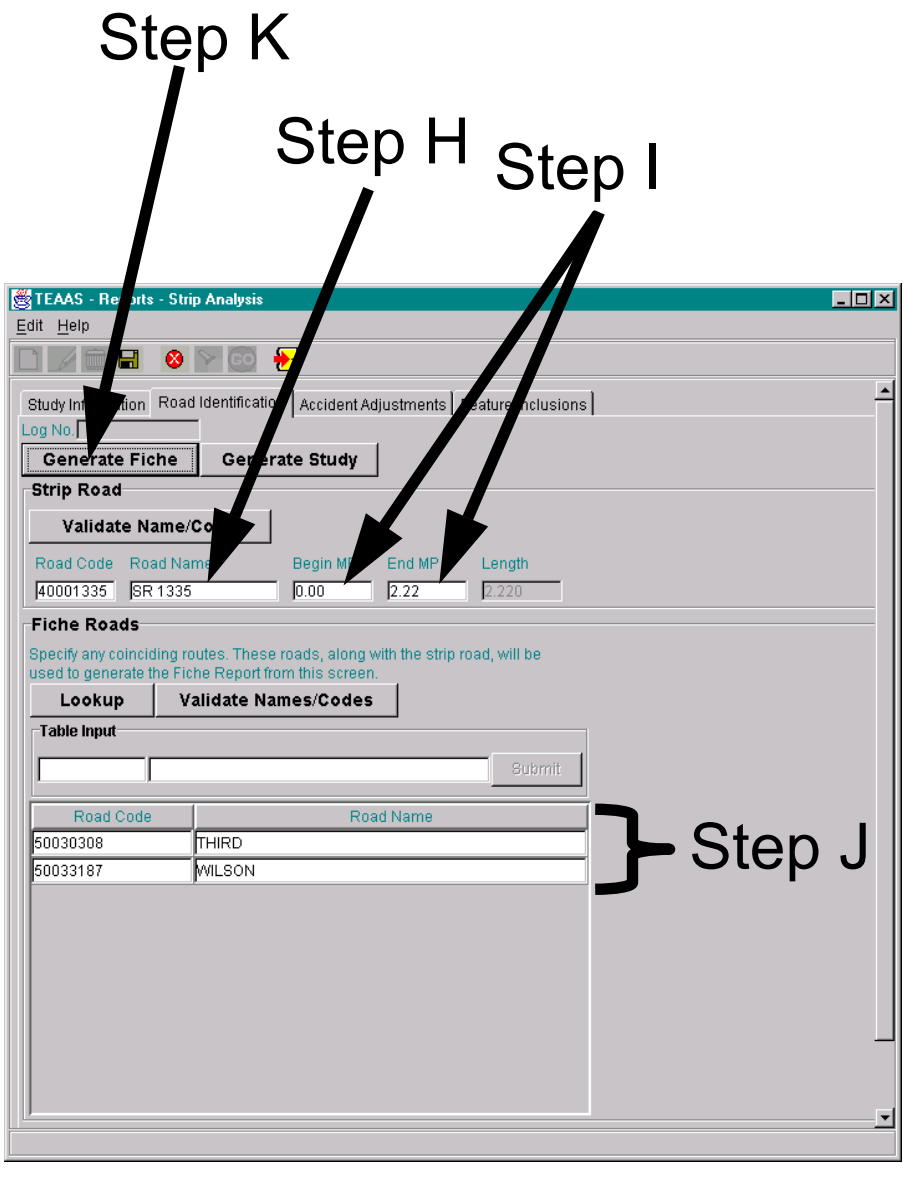
(The study route should be the most continuous route)

Step I - Enter the beginning and ending mileposts for SR 1335 (0.00-2.22)

Step J - Enter the coinciding routes (Third and Wilson) into the “Fiche Roads” section

(There is no need to include SR 1335 in the fiche roads since it has been entered as the strip road)

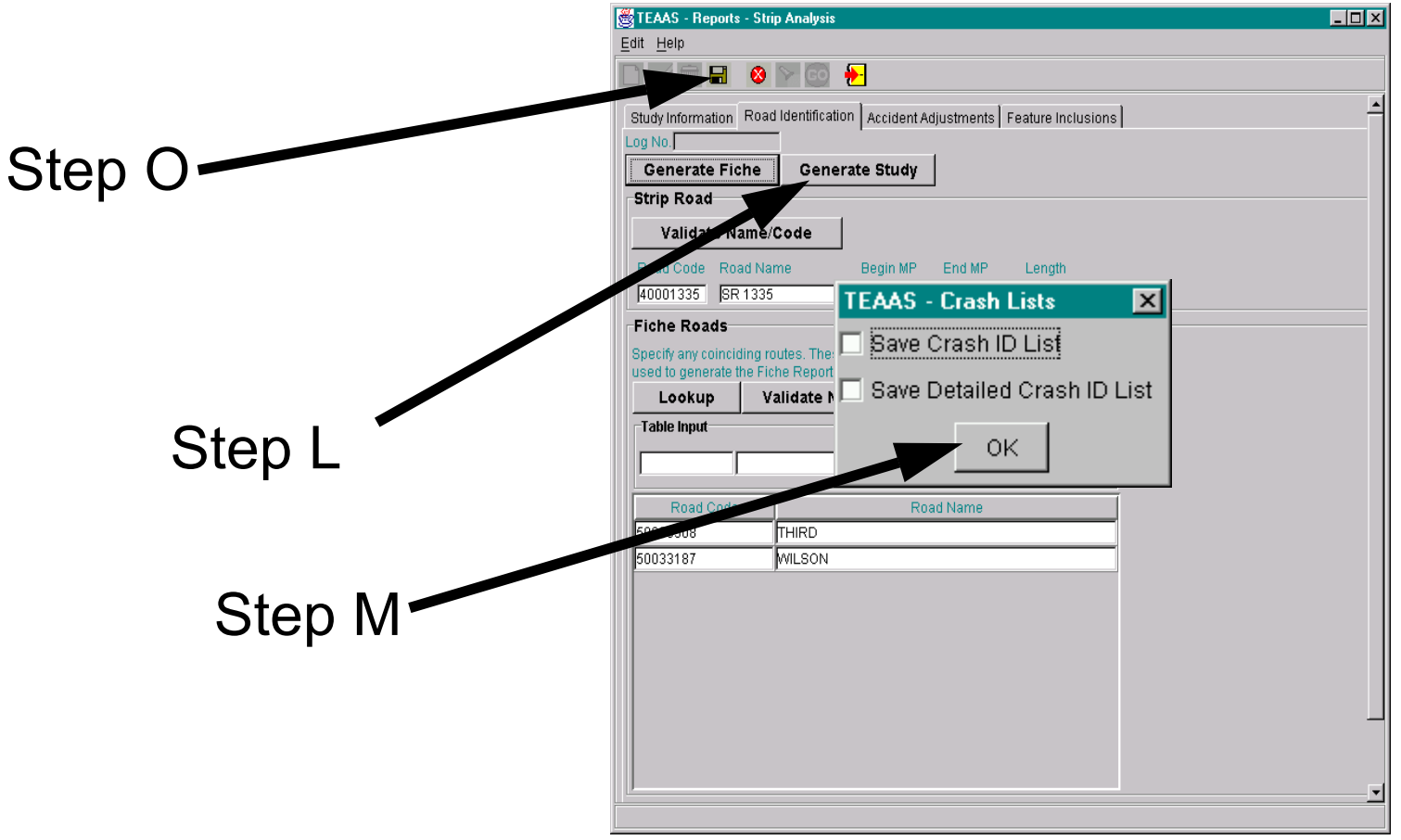
Step K - Generate the fiche report



Remember - use caution if using the “Lookup” button!

Strip Study Example (Cont.)

Step L - Generate the initial study
Step M - Save the list of Crash IDs (optional)
Step N - Print or save the initial study (optional - not shown)
Step O - Save the study



Strip Study Example (Cont.)

North Carolina Department of Transportation
Traffic Engineering Accident Analysis System
Strip Analysis Report

Study Criteria Summary

County: WASHINGTON **City:** All and Rural
Date: 1/1/1996 **to** 12/31/1999 **Study:** WASHINGTONSR1335
Location: SR 1335 (Third, Wilson)

Report Details

Acc No	Crash ID	Milepost	Date	Accident Type	Total Damage	Injuries				Condition			Road		Trfc Ctl	
						F	A	B	C	R	L	W	Ch	Ci	Dv	Op
1	**98212676**	0.000	11/03/1998 12:37	LEFT TURN, SAME ROADWAY	$ 5500	0	0	0	1	2	1	3	1	0	0	2
Unit 1 : 1	**Alchl/Drgs:** 0	**Speed:** 5 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:** 8	**Obj Strk:**											
Unit 2 : 2	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:**											
2	**99074804**	0.017	04/22/1999 05:10	RAN OFF ROAD - LEFT	$ 5000	0	0	0	0	1	5	1	5	0	0	2
Unit 1 : 1	**Alchl/Drgs:** 7	**Speed:** 60 MPH	**Dir:** S	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:** 34											
3	**98128649**	0.100	07/10/1998 21:20	RAN OFF ROAD - RIGHT	$ 8000	0	0	3	1	2	5	2	1	0	0	2
Unit 1 : 1	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** W	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:** 33											
4	**96145144**	0.300	08/03/1996 01:05	RAN OFF ROAD - RIGHT	$ 1000	0	0	0	0	2	5	2	1	0	0	2
Unit 1 : 3	**Alchl/Drgs:** 0	**Speed:** 45 MPH	**Dir:** N	**Veh Mnvr/Ped Actn:** 4	**Obj Strk:** 58											

Strip Study Example (Cont.)

Muni. Code	On Road	Miles / From	Dir	From Road	Toward Road	Milepost Road	Milepost	Crash ID	Date
428	ADAMS	0.000	S	THIRD	MADISON		999.999	98015535	1998-01-23
428	MADISON	0.000		THIRD	MAIN		999.999	97184529	1997-09-30
428	MONROE	0.000		THIRD	WILSON		999.999	96178776	1996-09-19
428	THIRD	0.000		ANDREW JACKSON	FOURTH		999.999	98056359	1998-03-25
428	THIRD	0.000		ANDREW JACKSON			999.999	96237919	1996-12-04
428	THIRD	0.000		JEFFERSON	FOURTH		999.999	98193406	1998-10-08
428	THIRD	0.000		MADISON	ADAMS		999.999	98191616	1998-10-07
428	THIRD	0.000	N	MADISON	MAIN		999.999	98212675	1998-11-03
428	THIRD	0.000		MONROE	WILSON		999.999	97034691	1997-02-21
428	THIRD	0.000		MONROE	US 64		999.999	97030231	1997-02-14
428	THIRD	0.000		MONROE	WILSON		999.999	97029145	1997-02-13
428	THIRD	0.000		MONROE	WILSON		999.999	96175516	1996-06-15
428	THIRD	0.019	E	RANKIN	ANDREW JACKSON		999.999	97187120	1997-10-04
428	THIRD	0.009	W	WASHINGTON	JEFFERSON		999.999	98026743	1998-02-09
428	THIRD	0.000	W	WILSON	MAIN		999.999	99258041	1999-12-20
428	WEST	0.000		WILSON			999.999	96028023	1996-02-05
428	WILSON	0.009	S	*LCL WINSETTE CIR	FOURTH		999.999	99120224	1999-06-24
428	WILSON	0.019	N	CAMPBELL	PINE		999.999	96256867	1996-12-27
428	WILSON	0.009	N	CHESTNUT	BRINKLEY		999.999	97025245	1997-02-08
428	WILSON	0.009	N	CHESTNUT	BRINKLEY		999.999	97025244	1997-02-08
428	WILSON	0.019	N	CHESTNUT	CAROLINA		999.999	97097521	1997-05-23

Strip Study Example (Cont.)

Step P - Review the crashes on the fiche report and compare them to the initial study to determine if there are any crashes that need to be added, deleted, or remileposted.

EXAMPLE:

Adds

96028023 1.45
96145144 0.30
96175516 2.05
96178776 2.05
96217726 1.46
96243509 1.91
96251310 1.62
96256867 0.90
97025244 1.65
97025245 1.65

Remileposted

99258041 1.98

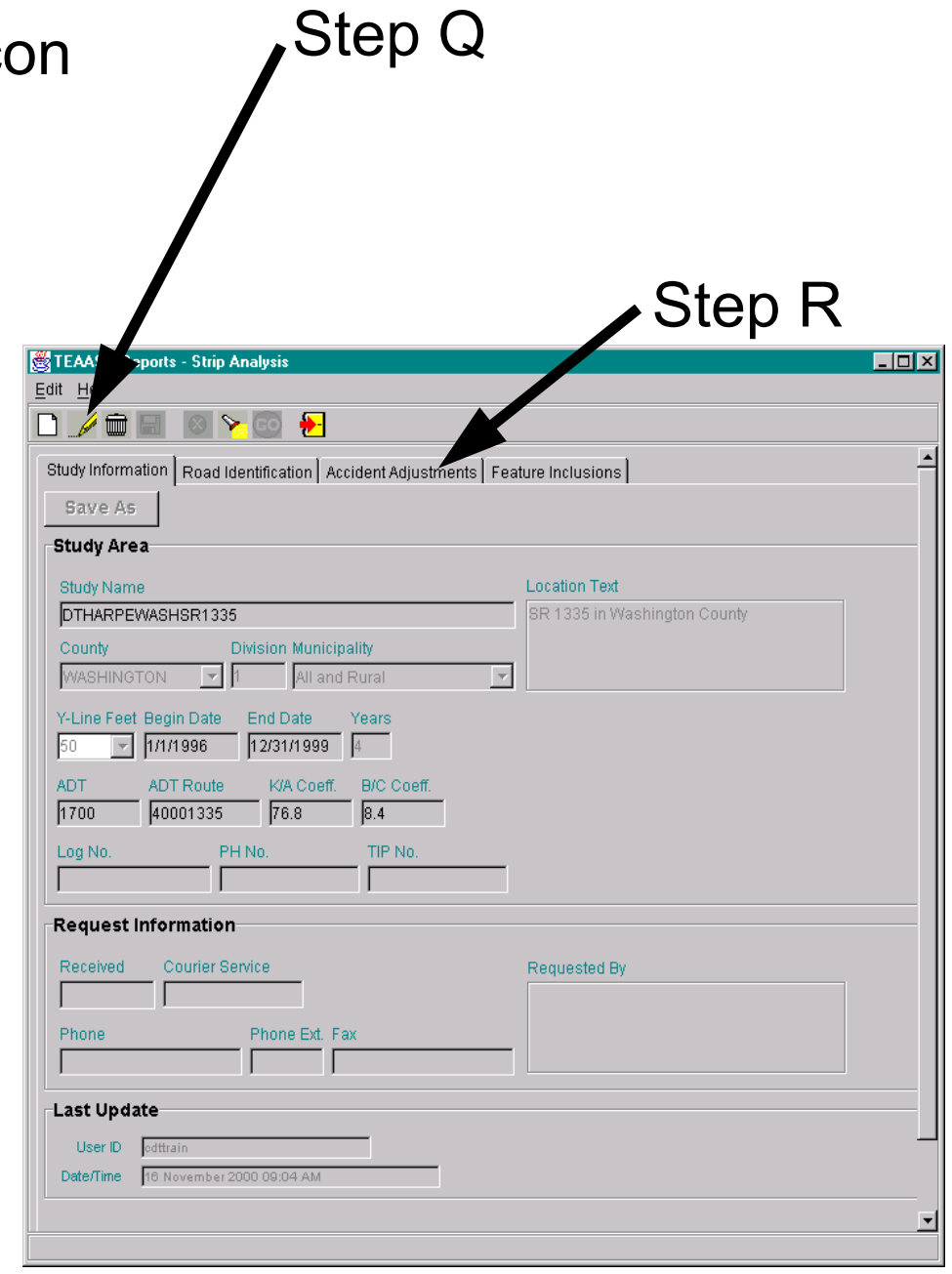
Deletes

NONE

Strip Study Example (Cont.)

Step Q - Click on the **“Modify”** icon

Step R - Go to the “Accident Adjustments” tab



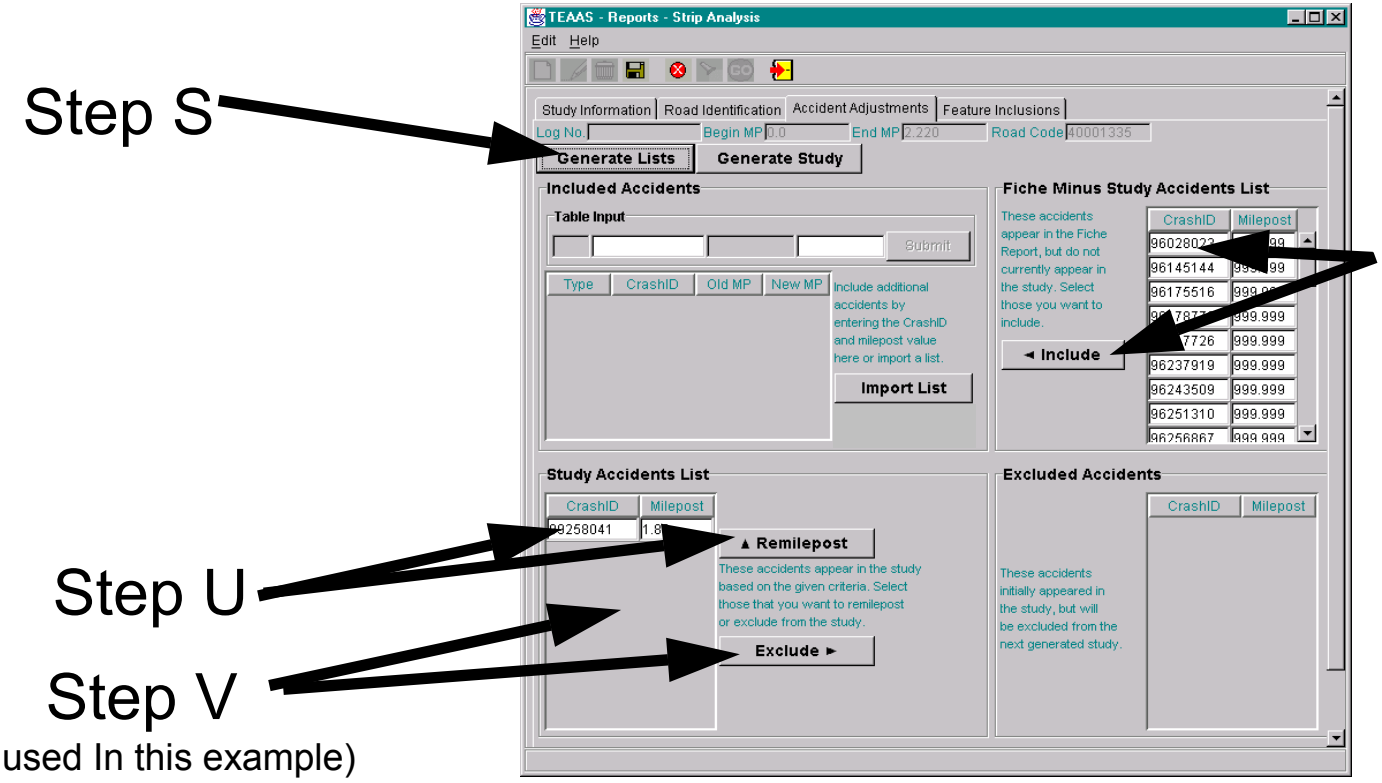
Strip Study Example (Cont.)

Step S - Click the **“Generate Lists”** button.

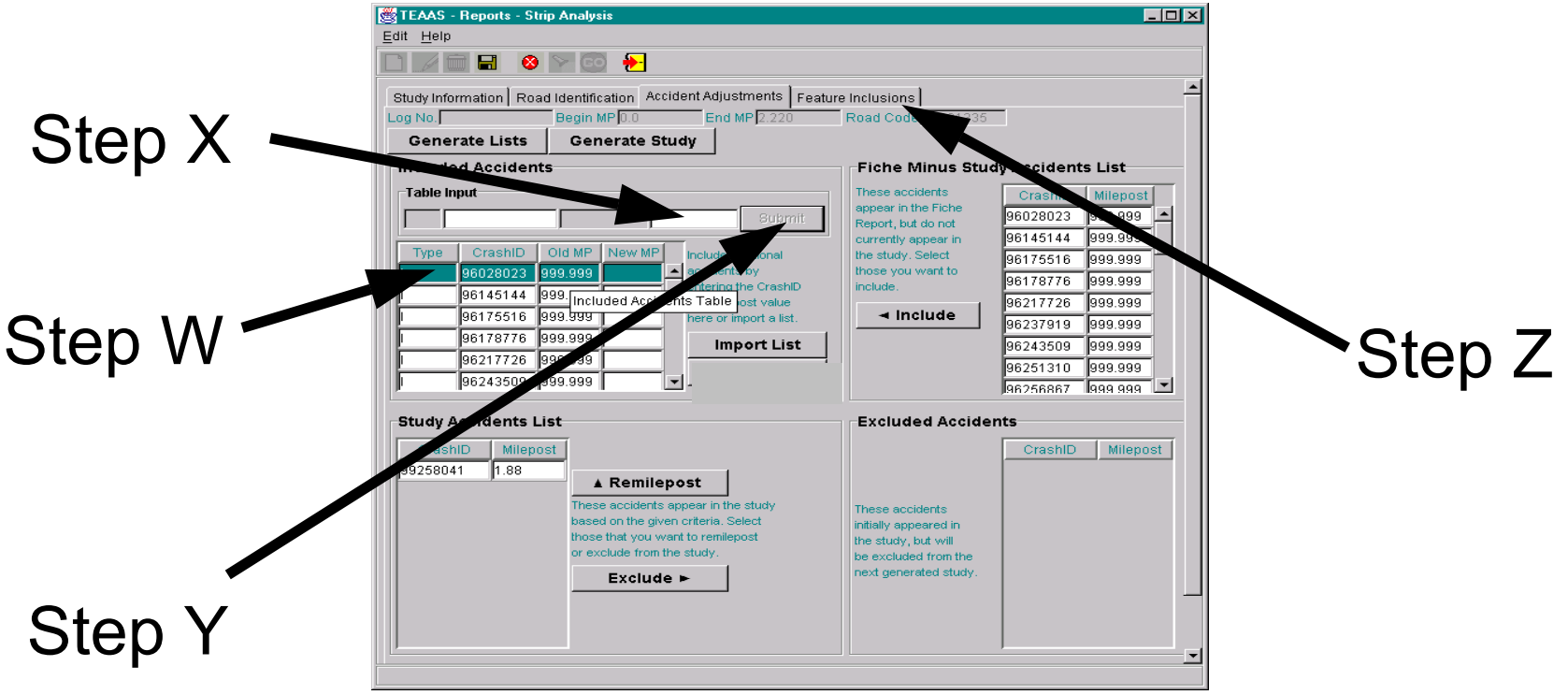
Step T - Highlight the crashes to be added in the “Fiche Minus Study Accidents List” table, then click the **“Include”** button

Step U - Highlight the crashes to be remileposted in the “Study Accidents List”, then click the **“Remilepost”** button

Step V - Highlight the crashes to be excluded in the “Study Accidents List”, then click the **“Exclude”** button



Strip Study Example (Cont.)



To remilepost crashes, complete steps W through Y:

Step W - Highlight the crash in the “Included Accidents” table and click the **“Enter”** key.

Step X - Assign a new milepost value to the crash

Step Y - Click on the **“Submit”** button

Step Z - Go to the “Feature Inclusion” Tab

Strip Study Example (Cont.)

Step AA - Determine the features that need to be mileposted on the strip route. In this example, the following features need to be added:

FEATURE TEXT	MP of Feature
PLYMOUTH CITY LIMITS	0.70
SR 1336/BATEMAN ST	1.08
START OF THIRD ST	1.96
HYMAN LANE	1.01
CAMPBELL ST	0.88
PINE ST	0.80
GOLF ST	1.36
WASHINGTON ST	2.20
JEFFERSON ST	2.11
MONROE ST	2.04
FOURTH ST	1.88
RR TRACKS	1.81
CHESTNUT ST (NORTHERN END)	1.79
CHESTNUT ST (SOUTHERN END)	1.60
US 64	0.00
POST OFFICE	2.13
WALMART PVA	1.85

(Note - repeat Steps AA through BB for each feature to be added)

Strip Study Example (Cont.)

Step BB - Enter the text of the new feature

Step CC - Enter the milepost value of the new feature

Step DD - Click the **“Generate Study”** button to generate the final study

Step EE - Click the **“Save”** button to save the final study